

Medical Society
OBSERVATIONS

25

ON THE
COMPARATIVE ANATOMY
OF THE
MUS MUSCULUS,
OR
COMMON MOUSE.

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MAN, DISSERTATION ON THE COMPONENT PARTS OF AN ANIMAL BODY, &c.

“Next to the anatomy of man, there is no study more worthy the
attention of the philosopher than a contemplation of the formation
of those animals by whom we are surrounded.”

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TO
HIS ROYAL HIGHNESS
THE DUKE OF SUSSEX,
PRESIDENT OF THE ROYAL SOCIETY, ETC.

THESE OBSERVATIONS
ARE MOST RESPECTFULLY INSCRIBED ;

INASMUCH AS

THE AUTHOR

FEELS ASSURED THAT THE SMALLEST ATTEMPT
TO ELUCIDATE
THE STRUCTURE OF ANY OF THE ALMIGHTY'S WORKS
WILL EQUALLY MERIT, NOT ONLY
HIS ROYAL HIGHNESS'S PATRONAGE,
BUT LIKEWISE
HIS APPROBATION.



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PREFACE.

THE following observations, which were originally published in No. VII. of the Scientific Gazette, having met the approbation of many talented friends, I have at their request republished them in a separate form, which I trust will be so fortunate as to excite the approval of the Scientific Public.

As it is my intention to publish accurate Anatomical descriptions of the various creatures by which we are surrounded, from my own dissections, I shall feel much obliged to any gentleman who may feel disposed to aid my labours by transmitting me any zoological subject for that purpose whether foreign or domestic, *carriage free*.—And such as may feel inclined to subscribe to these Zootomical papers, or any other of my works, are requested to address me a line, *postage paid*, which will meet prompt attention.

N.B. The next paper in succession to the following will be some Observations on the Zoology and Comparative Anatomy of the *Rana Temporaria*, or common Frog; which has, for some length of time, been in preparation.

OBSERVATIONS
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It is rather surprising that, in the present state of science, and march of intellect, so little attention should be paid to the anatomy of the various animals by which we are surrounded. On this occasion I shall make a few observations on the peculiarities of structure as existing in the *mus musculus*, or common mouse, an animal whose external appearances are so well known, as to require no extensive description from me; but the remarks I here make will, with but few exceptions, point out the characteristics of the whole tribe. I shall therefore commence by stating the zoological arrangement in which this genus stands, and which was followed by my friend and preceptor Joshua Brookes, Esq. in the general classification of his magnificent museum; that of the *Mus* tribe, was first adopted by Dr. Macartney, of Dublin; it is as follows:—

Class — Mammalia.

Order — Glires.

Family—Saltigrada.

Genus — Mus.

Species—Musculus.

ZOOLOGICAL DESCRIPTION.

The following are the zoological characters of this animal by the Rev. Dr. Fleming :—The body is about three inches

in length, of a yellowish brown colour superiorly, mixed with small black hairs inferiorly, and on the belly of an iron grey. These animals are extremely prolific, producing from six to eight at a birth, but as many as sixteen have been discovered in a single nest. White, pied-ball, or black and white mice, are occasionally found; these in general are only propagated by youth for their amusement, and the latter variety are very rarely discovered in comparison with the two former.

ANATOMICAL PECULIARITIES OF THE SKELETON.—Having said thus much of the external appearance of this animal, I now proceed to point out the osseous peculiarities characterising this genus.

The Head.—The parietal or sagittal suture* dwindles into a straight line; and according to many authors it entirely disappears, but it is visible in several crania now before me. Professor Meyer first described what I have denominated the *tentorial* process of the parietal bone,† but he named it the *os transversum*, or the *osseous tentorium*.

The mastoid processes are not attached to the temporal bones, as in man, but in fact to the occipital; and neither is the squamous process so large in proportion, as in the human species.

The convexity of the zygomatic arch is turned downwards, and in some species of this genus the *Ephippium*‡ is wanting, and also the *Canalis Caroticus*, inasmuch as the *Arteria Cerebralis* passes through the *foramen lacerum*.

Anteriorly we find the inter-maxillary bones large, forming the whole of the upper-jaw, containing the incisor or superior gnawing teeth, which distinguish this order from the *carnivora*. The posterior lateral or molar teeth in the upper jaw, are very large; in some genera of this order, the

* Vide my "Synoptical Table of the Sutures, &c." 4th Edit. page 9.

† Observations on the Anatomy of the Domestic Cat, by H. W. Dewhurst—*Veterinarian* for October, 1828.

‡ Syn. *Sella Turcica*.

floor of the orbit is completely bulged up in consequence: their grinding surfaces possessing little sharp tuberculated points, enveloped in a beautiful polished enamel, which, however, does not wear, inasmuch as it is intermixed with the osseous matter.

The *palatine bones* possess but little share in the formation of the orbits. The *os jugale*, or cheek bone, is placed in the middle of the *zygoma*,—the superior maxillary bone forming the anterior *zygomatic process*. The lower jaw is composed, like that of most other animals, of two pieces united together at the *symphysis*, by means of an intervening cartilage. The *condyloid process* is of considerable size, whilst the *coronoid*, on the contrary, is very short, and is placed anteriorly and laterally towards the last molar tooth; consequently, it is between the moving power and the point upon which the jaw moves; the design evidently being to increase the power of the incisor teeth, by the application of the force arising from the action of the temporal muscle being carried so far anteriorly.

The *ethmoidal bone* is very extensive, and, like most other animals whose subsistence depends in part upon the acuteness of their organ of smell, approaches towards the anterior part of the nostrils.

The cerebral cavity.—In this order of animals the cerebral cavity is of an oblong shape, and not spherical, as in the human subject, and some of the monkey tribe. However, in some of the cetacea, the porpoise for example, this cavity is globular, more approaching to that of birds. The internal surface accordingly corresponds with the impressions produced by the convolutions of the brain. According to the calculations of Baron Cuvier, the following is the proportion of the brain to the general dimensions of the body—*

* These proportions vary according to the age of the individual. For a concise, but brief description of the general anatomy of the brain in man and animals, its relative weight, proportions, &c. &c.

Proportion of the cerebrum.

<i>In man.</i>		<i>In the mouse.</i>
From $\frac{1}{22}$ to $\frac{1}{35}$		About $\frac{1}{43}$

Proportion of the cerebellum.

<i>In man.</i>		<i>In the mouse.</i>
From 1 to 2		From 1 to 9

The membranes enveloping the brain are not dissimilar to those found in other animals of the same class.

The trunk.—The trunk of this animal is composed of the following bones :—

Inferiorly —The sternum*

Superiorly—The vertebræ†

Laterally —The ribs

Posteriorly—The pelvis‡

The ribs and dorsal vertebræ are twelve in number, and the latter has very small spinous processes. The cervical are seven, and on the second and last is placed an acute spinous process. There are seven lumbar ; and the sacrum, instead of being one single bone, as is found in man and most adult animals, is formed of four pieces, although in the skeleton I have before me, the uniting cartilages are ossified ; but as far as my researches have gone, it is as I have stated. The caudal vertebræ, or those forming the tail, are twenty-four in number, whilst the tail is made to move in all directions by a variety of beautiful small muscles.

With regard to the sternum, it differs from that of the human subject, where it is broad and flat, and composed of two or three distinct pieces, but which, however, in numerous instances, are ossified and become consolidated into

in the foetus and adult, I must refer the reader to the tables and remarks in my "Dissertation on the component parts of an Animal Body," 2nd Edit. 1830, p. 51 ; or to my "Guide to Human and Comparative Phrenology," pp. 28—36.

* Placed anteriorly in man and the monkey tribe.

† Situated posteriorly in man, and superiorly in all quadrupeds.

‡ Found posteriorly in most animals, but obliquely and inferiorly in man.

one single piece. In the mouse, it consists of five or six small portions united together by cartilage, and is much larger in proportion to the body, being both round and narrow, but in many old animals these become ossified.

The clavicle is most perfect in this animal, and is about a quarter of an inch in length.* In the scapula there is nothing very remarkable, with the exception of a sharp process superiorly. The os brachii, or arm bone, is short, and in one respect agrees with that of man, the monkey tribe, and many of the herbivora, in not possessing the foramina for the passage of the brachial artery, in the internal condyle, which is found in the cat and other carnivora. The coronoid process of the ulna is almost obliterated, and the radius covers the articulation. The bones of the carpus are nine in number, but in this tribe the os scaphoides and the os lunare are ossified together. There is also a supernumerary bone, much larger than the os sub-rotundum.†

The metacarpus consists of five bones, with corresponding phalanges.

The Pelvis.—This posterior part of the trunk is formed by the ossa innominata, laterally.‡ The foramen ovale is placed posteriorly to the acetabulum, and is very large. The inferior outlet of the pelvis, instead of being as in the human subject, is placed posteriorly, not only in this species, but likewise in most of the quadrumana.

The os femoris is very large when compared with the os brachii, and the condyles are very beautifully formed, and do not appear to differ from the human subject. Nothing peculiar is noticed in the patella. The tibia is rather convex anteriorly, which occasions a wide space between the external lateral spinous process and the fibula, whose con-

* In many of the Saltigrada, there is but a very imperfect clavicle suspended by the muscles, and not connected with the sternum, or scapula, but which is denominated by Vicq. D'Azyr the *os clavicularae*.

† Syn. Os Pisiforme.

‡ The os ilium is placed anteriorly, the os ischium posteriorly, and the os pubis inferiorly.

vexity is placed posteriorly. The os calcis has its calcanean process, as in man, for the insertion of the tendo achillis. The bones of the foot are much larger than those of the fore paw, both of which terminate by very beautiful and delicate nails, with the convexity downwards.

THE THORACIC ABDOMINAL, AND PELVIC VISCERA.—The respiratory organs are divided in this animal as follows :—There are four lobes to the lungs of the right side, and but one on the left,* which are of a pinkish colour.

The heart corresponds with the same viscus in other mammalia. The pericardium is thin and transparent. The œsophagus is nearly diaphanous in its tunics, and consequently very thin.

The arch of the aorta is conical, instead of transverse, as in man ; giving off two branches, as observed in the cat,† dog, and some others of this class. The first I denominate the TRUE *arteria innominata*, inasmuch as it gives off the right subclavian, and both carotids ; however, the left subclavian arises separately, and forms the second.

The thyroid gland is divided into two large lobes lying on the trachea.

The diaphragm is analogous to most animals of this class, and the liver is divided into several lobes, viz. four on the right and two on the left, thus differing from the human subject, which possess but three.

There is a very curious peculiarity in this animal, wherein it deviates from man, inasmuch as it is devoid of a gall-bladder ; however, the sinus portæ is very large.

The spleen is oblong and flat in this creature, notwithstanding some anatomists have stated it to be triangular.

The stomach in this tribe is very curious when contrasted with that of man, and many other animals, the cat, dog, horse, &c. &c.; for example, the greater curvature

* Occasionally this lung is divided, and then we find two.

† Vide my paper on the Structure of this animal in the *Veterinarian* for October 1823.

forming a perfect *cul de sac*, the œsophagus terminating in the middle of the upper surface of the stomach, at no very great distance from the pylorus. In the common Norway rat, when recently examined after death, we not unfrequently find a contraction in its centre, dividing it into two cavities; but when distended with air or water, it becomes one perfect uniform bag. That venerable zootomist and physiologist, Sir Everard Home, is of opinion, that this division is the effect of a muscular contraction, and in this idea I coincide. This peculiarity of structure is found in the whole *Mus* genus. In the *Water Rat* a variation is found, *i. e.* where a muscular septum forms the contraction when in action, and when it is of course actually divided into two cavities.

The length of the intestines are as five to eight. This animal possesses a cœcum with a colon rather large at its commencement, but which afterwards becomes much contracted by means of oblique or spiral striæ, formed by the internal membrane.

The kidneys are enclosed within a duplicature of extremely thin and transparent peritoneum.* The suprarenal capsules constitute about one-fourth of the size of the kidneys, during the whole life of the animal, and this remark applies generally to the whole of this genus.

Upon opening the abdomen, the appearance of the intestines is not dissimilar to the coiling of a rope cable by seamen. The bladder is somewhat about the size of a small pea.

Organs of Generation, the Male.—The testicles of this tribe are very large, as well as the abdominal rings, posterior to which the seminal glands are situated, so that they are enabled to pass and repass these openings with the greatest fa-

* I have frequently demonstrated, to my own satisfaction, and that of numerous professional friends, that, contrary to the opinion of anatomists in general, the kidneys are enveloped, like the other organs within the cavity of the peritoneum, both in man and quadrupeds. I must, however, in justice to Mr. Brookes and Mr. Somers, state, that this act was previously demonstrated by these gentlemen.

cility, without injury. There is a scrotum to contain the testes, but nothing peculiar is observed in its conformation. This animal is likewise provided with an os penis. The prostate glands in this tribe are tubular, and possess an addition of two glands attached to the internal surface of the vesiculæ seminales, which are composed of one single tube.

The glans penis in the mouse and dormouse is conical and sharp-pointed, the urethra opening at the termination.

The Female.—The orifice of the *vulva* is not provided, in this class, with the external and internal labia. It consists of a single fissure, taking the direction of the body. The clitoris is placed external to the vulva, and the skin is also anterior to it, forming a projection which serves the part of a clitoris, at which place the urethra terminates. The uterus is bicorned, as in most viviparous animals, and the placentæ are orbicular, as in the cat, &c., surrounding the fœtuses and the placental membranes.

The lacteals and thoracic duct may be seen occasionally very beautiful; this was the case with one I opened this day, but there was nothing differing from other animals. The *eyes* in the common mouse are black, but in the albino and pied-ball, they are of a brilliant scarlet colour, owing of course to the non-existence of the pigmentum nigrum, and thus proving, in a very beautiful manner, the great vascularity of the choroid coat and iris.

Like most of the mammalia, at least as far as my own researches have gone, this animal possesses no uvula. The tongue is oblong and smooth on its external superior surface.

The abdominal muscles are extremely thin, but the external skin is very loose.

The tail is entirely destitute of fur.

These are the chief peculiarities that I have as yet noticed in investigating the anatomy of the mus genus, and I trust they will meet the approbation of the scientific public.